Lunar Volcanism

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Pyroclastic Deposits

- Volcanic material
- Low albedo
- Smooth, rough, blocky
- To name a few:
  - Atlas
  - Alphonsus
  - J. Herschel
- Volcanic source vents
  - Floor fractures
  - Craters

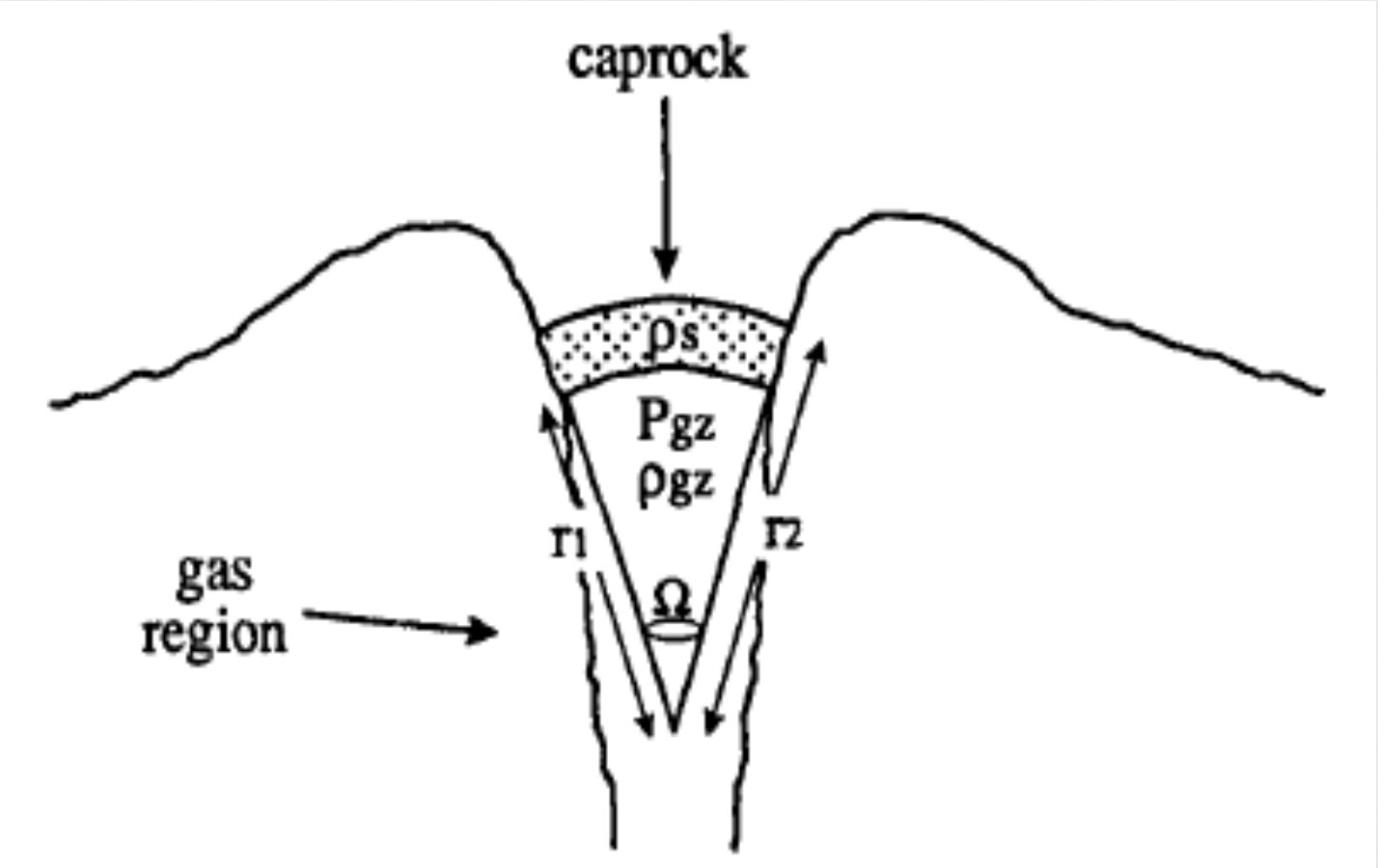
Volcanism

- Strombolian
  - Typically low silica content
  - Bubbles
- Vulcanian
  - Higher presence of silica
  - Caprock
  - Intermittent

Methods

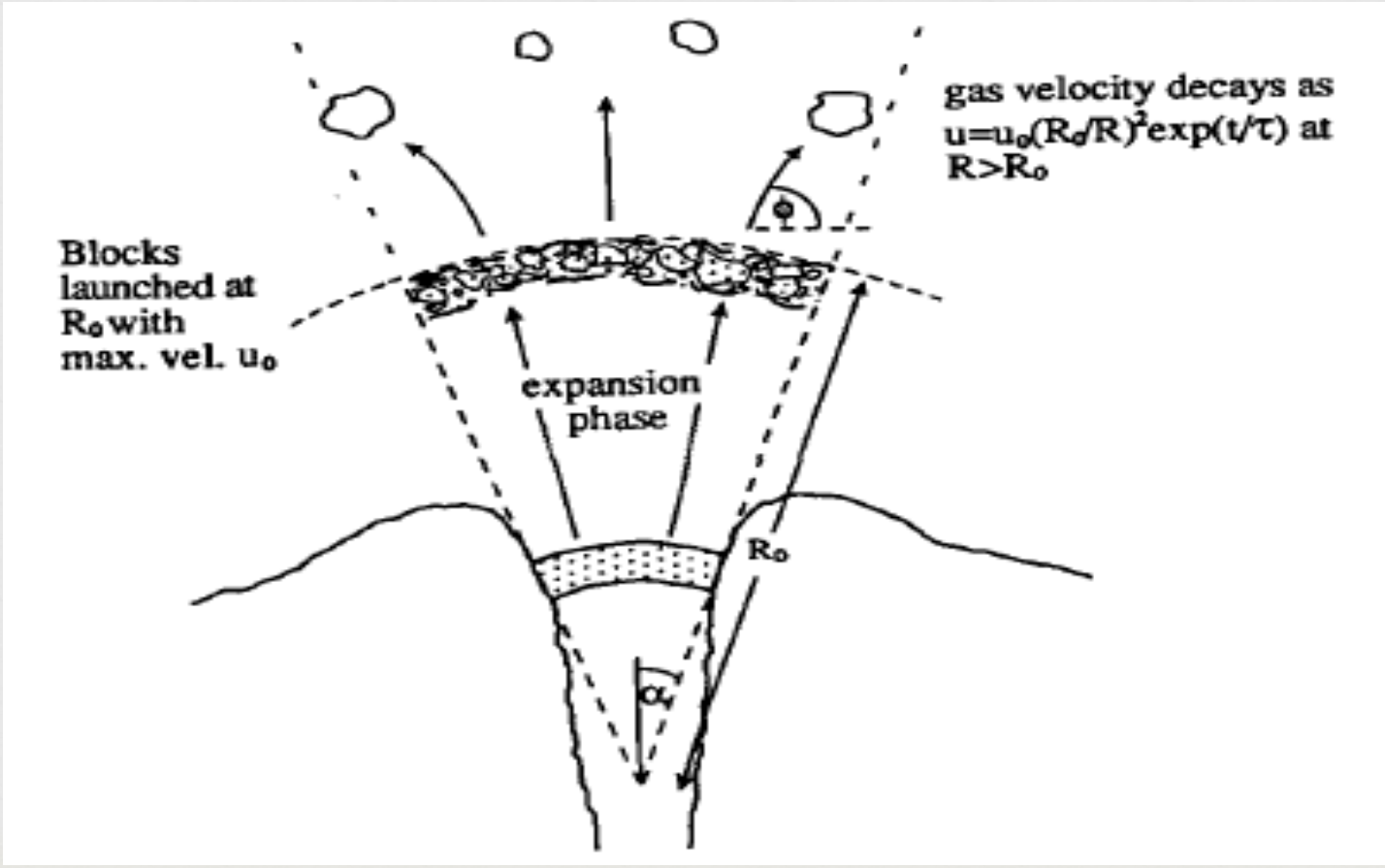
- Georeferencing
  - ArcGIS
- Crater Measurements
  - ArcGIS
  - ISIS
  - Excel
- Modeling
  - Excel

Magma



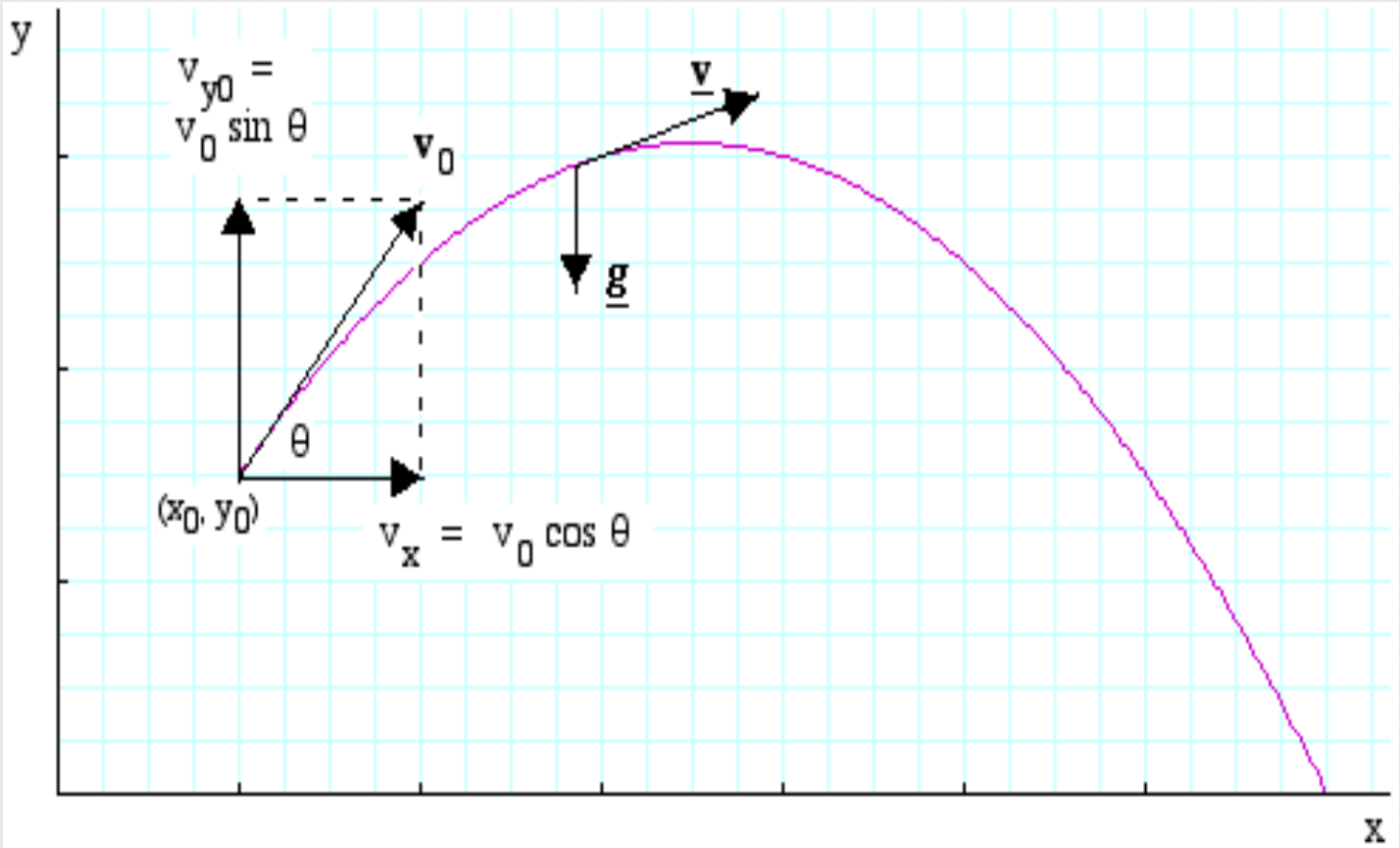
Fagents & Wilson (1993)

Ejection



Fagents & Wilson (1993)

Trajectory

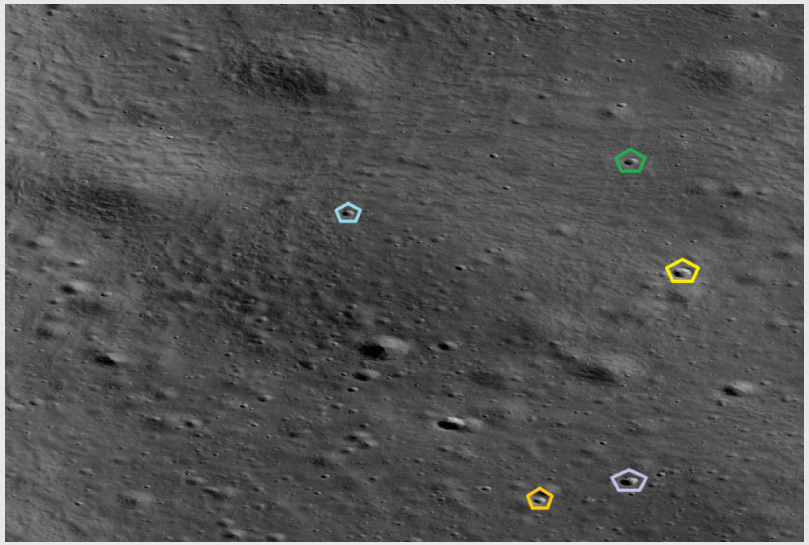

y
$v_{y0} = v_0 \sin \theta$
v_0
$\underline{v}$
$\underline{g}$
θ
(x_0, y_0)
$v_x = v_0 \cos \theta$
x

ArcGIS

- ArcCatalog
  - Assign coordinate system to images
- ArcMap
  - Import images
  - Create tie points to relocate images to a different point
- Allows for easier viewing

ISIS

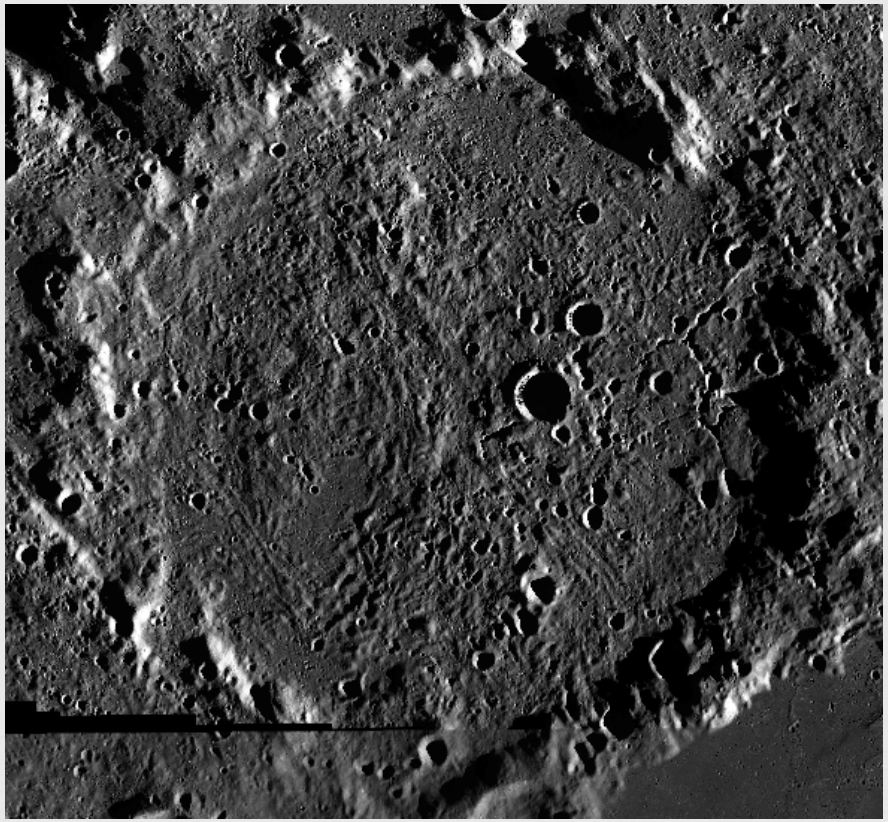
- Craters are measured
- Screenshots are taken to keep track of which craters have been measured
- Can also be used to create a mosaic



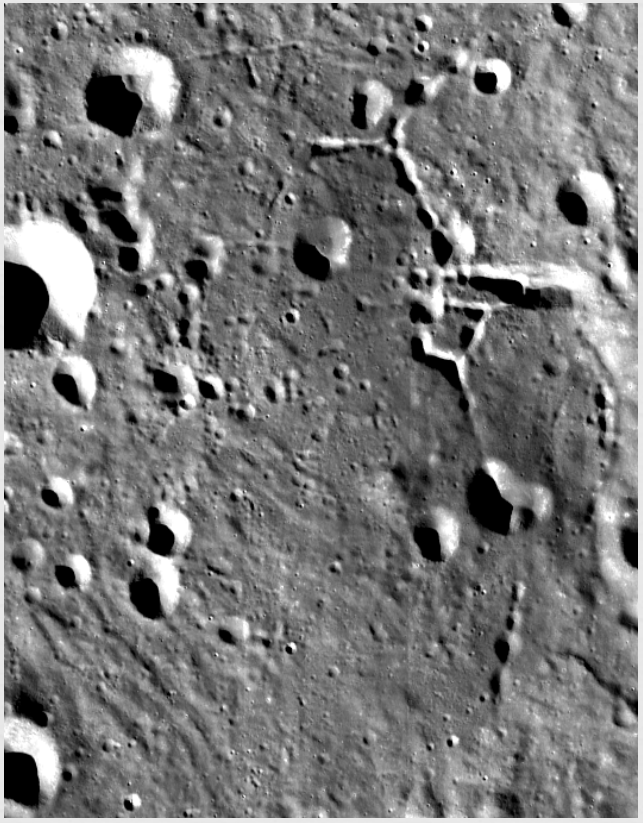
Excel

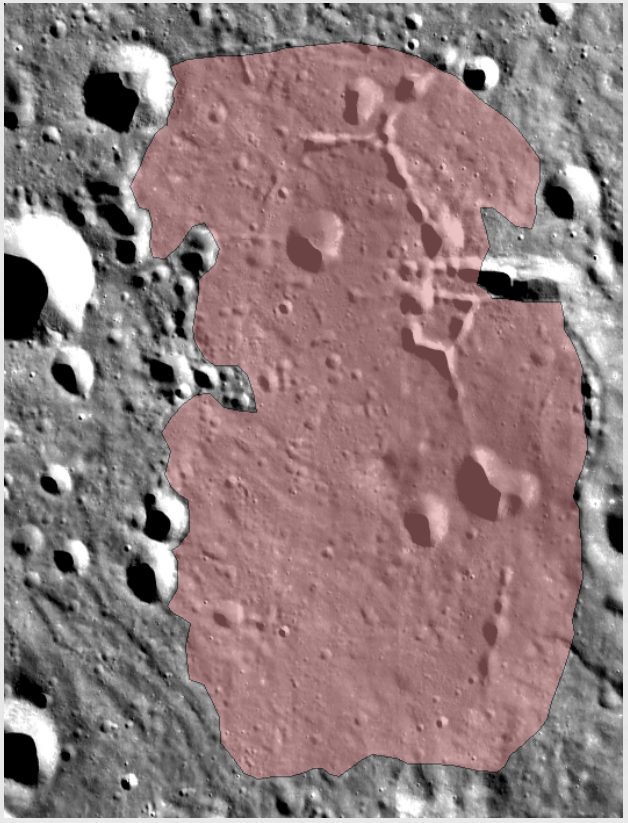
- Used for entering data and doing computations
- Crater measurements are entered
  - Average diameter
  - Rim height
  - Use ArcMap to locate coordinates of crater
- Modeling is done
  - Initial conditions (pressure, gas content, etc.)
  - Range of pyroclasts

J Herschel Crater



Major Deposit





Characteristics

- 70% olivine
- 30% pyroxene
- 165 km diameter
- Area: 60 km by 35 km

Goals

- Develop an isopach map
- Use model to run a simulation
- Develop a general model
  - Are pyroclastic deposits from different areas erupted by different means
  - How do they differ

Questions?